TECHNOLOGY DIVISION

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HUMAN NATURE AND WAR

by
George M. Stratton,
Professor of Psychology,
University of California

Of the Four Horsemen described in the Apocalypse, science gives us high hope that at least two can be unhorsed. By our increasing medical knowledge we are gradually ridding the world of Pestilence. And there is reason to believe that science will rid the world of Famine. But with regard to War there are many who assert that science offers no hope whatever; that it indeed closes the door of hope and leaves us to despair.

For war, it is said, springs from human nature; and it will continue as long as our unchanging human nature lasts.

Those who declare that war comes from human nature, and that human nature does not change, have weighty evidence in their favor. Wars have occurred since the remotest time of history. Wars doubtless were waged long before history began. Fighting reaches still farther back, into the animal world, where it is frequent and wide-spread. Thus all the momentum of our animal and human inheritance would seem to carry us fatally forward along the ways of war. Humanity seems pugnacious in its very nerve and muscle; man, it would appear, is born to battle as the sparks fly upward. Human nature, through all the ages, reveals certain constant qualities, and whatever may be the strong desire for another order of life, so it would seem, no other order may be expected.

And yet institutions based upon permanent traits of human character have been torn down and swept away, and without destroying or even weakening a single one of these lasting traits of our nature.

Let us go back, not to the cave-man, but to comparatively recent times in America, Asia and Africa, where it was customary to sacrifice living men to the gods. Sometimes these sacrifices were of the worshipper's own children; for by offering something still more precious than war prisoners - more precious both to the worshipper and the god - it was thought that the divine wrath could be appeased.

We may imagine the opposition when it was proposed to do away with this ghastly institution. "What!" it must have said. "Do you expect us to surrender our very religion - to refuse to our god the rarest, the most valued things we have!" But in spite of such misgivings, human sacrifice was abolished from all lands, and without altering a single one of the deep motives which supported it.

Similarly, blood vengeance once existed almost the world over. The death of a member of one's own family must be avenged, it was felt, by taking a life from the family that caused the death. Even, so mild a statesman as Confucius believed that a lesser official could not live in the same country with one who had killed a high officer of state: that a subordinate must personally see that the death of his superior was avenged.

Yet the institution of private blood-vengence has been done away with, and without requiring human nature to change by so much as a hair's breadth. We simply have instituted better methods of satisfying the ancient human impulses, while leaving the impulses themselves strong and untouched. In the same way one might speak of piracy and of duelling, which also have been virtually abolished while human nature remains unchanged.

But I hasten on to slavery, which comes closer to us, and whose abolition is within the memory of men who still live. Slavery's hold is from earliest times. The enslavement of others has marked the leading peoples of the world. Civilization itself has seemed impossible without it. Only yesterday the living bodies of men and women were bought and sold even in our own land.

But when the time came for Lincoln to sign the great Proclamation, did he by one jot or tittle have to annul the laws of human nature itself? No. He left men, as before, to be avaricious still. They still are ready to use other men for their own interests. But men have been prohibited from buying and selling men as one buys cattle.

Now is war, in its relation to human nature, essentially different from these other forms of social behavior which have disappeared? War unquestionably is one of the modes in which our nature finds expression. So deep are war's foundations, so firm its iron hold, that all thoughtful men will have at times almost some touch of despair that there can be success against it.

And yet despair is not scientifically justified. Confidence of success here can be had without forgetting or distorting human nature. Hope can be held without shutting one's eyes to the plain facts of psychology. It may well be true that in all its large outline human nature does not change. And yet our experience shows that our unchanging nature permits important changes in human conduct. Indeed, under the stimulation of social enterprise, human nature not only permits but demands profound changes.

We cannot doubt that humanity will keep the great impulses which still lead to war, - among which are the love of wealth, the love of adventure, the love of honor, the love of Mother Country. Yet there can be a growing impatience, a growing abhorrence of satisfying these great impulses by the old bloody methods. Nor is there in the science of psychology anything to assure us that in this one region no further advance is possible; to assure us that here men have reached the last limit of their inventiveness; that they can institute no shrewder, no more satisfying devices to express their devotion to their own nation's life and to the life of the world.

Within wide limits human nature does not change. Yet we are wholly wrong if we suppose that, for the end we here have in mind, it needs to change. Great things have been done for humanity while human nature has remained the same. Our civilization has been rid of human sacrifice in religion, of private blood-vengeance in

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our civil life, of piracy upon the high seas, of slavery in all our leading communities. Every one of these social institutions has had the support of men's permanent passions, of men's deep impulses. To rid the world of these ancient instruments it has not been necessary to rid the world of men. Nor have we needed to wait until all sinners have been changed to saints. It has been necessary merely that men should be socially progressive, inventive, adventurous. Men have had to cooperate with one another untiringly to change the old habits of their life. New ways of justice and law and order have had to be viewed with hospitality, without a too-tenacious clinging to the cruder and less effective ways.

Human nature plays a double role. It runs with the hare and hunts with the hound. It expresses itself by remaining in the old, by reverting to the old. But it expresses itself no less by leaving the old, by moving to the new. It has not stood as a wall against progress. The advance, the untiring search for more effective institutions of justice, for more effective ways of meeting the rival claims of large groups of men, - these changes also are an utterance of our nature. The deepest forces behind human conduct do not merely oppose civilization; they press us to be more and more civilized. Human nature resists progress; but in all leading lands it also overcomes its own resistance, its inertia and habits, its own conservatism. Out of our human nature have come the motives, the human instruments and leaders, the intelligence, the insistent urging, which have enriched and strengthened our civil life. And these same great forces, psychology in no wise forbids us to expect, will bring the more favored nations to cooperate in establishing a better institution than war to do the work of war. Three of the Four Horsemen and not two only, we may hope will cease to scourge the world.

APRIL METEORS FOLLOW PATH OF HALLEY'S COMET

Nearly half a century will elapse before Halley's comet will again visit the regions of the earth, but if you look to the northeastern sky about the twenty-ninth of April and see some shooting stars, the chances are that you are observing some of the pieces of this famous comet. As these shooting stars, or meteors, come from a point in the constellation of Aquarius, the water bearer, which rises in the east just before the sun, ambitious persons, starting out on pre-breakfast golf-games, before sunrise, have the best chance of seeing them.

Though these meteors seem to move along paths radiating from a point in Aquarius, near the star "eta Aquarii", they are actually moving in parallel orbits. Just as the rails of a track seem to come together in the distance, the perspective effect makes the meteors seem to come from a certain point, whichastronomers call the radiant. The meteors always move along the same general path, and when, in April, the earth crosses it, the shooting stars are seen, giving rise to an unusually large number of meteors in a night, or an actual "meteor shower".

The meteors of the April shower, technically known as the "eta Aquarids," have been observed for many years at the same season, and it has been shown by an American astronomer, Dr. Charles P. Olivier, of the Leander McCormick Observatory at the University of Virginia, that the path through which this shower moves corresponds closely with that of Halley's comet. So in these shooting stars, we apparently have some of the material given off by this famous comet hitting the earth's atmosphere, and then, by friction, becoming incandescent.

Observations of meteors form one branch of astronomy in which the amateur can greatly aid the professional stargazers, for to find the exact path of a meteor, to tell how high it was when it first began to glow and to determine the direction from which it was coming, requires a large number of observations. Dr. Willard J. Fisher, of the Harvard College Observatory, is studying meteors and has received many valuable reports from persons who are not astronomers.

A good way of obtaining an accurate, and permanent, record, is by the use of photography, and the better the camera, and the faster the lens and the plate or film, the more meteors may be caught. At the Harvard Observatory the sky is photographed in sections every clear night, so that hundreds of thousands of plates have been obtained. On many of these Dr. Fisher has found trails of previously unnoticed meteors, but the amateur photographer can in many cases get records just as good.

Though the greatest display is on May 5, the meteors may be seen from April 29 to May 8, and on any of these nights it may pay you to try your hand at photographing meteors with your kodak.

The camera must be on some firm support, as a tripod, and pointed to the northeastern sky, the lens being opened to the widest extent. Keep the shutter opened for an hour at a time, between changing the film, and note the exact standard times of opening and closing the shutter. The Harvard College Observatory, at Cambridge, Mass., is always glad to get such negatives, because even though they may not seem to show any meteors, the keen eyes of the astronomers may find some. In this way, you may help astronomers to learn more of these bodies which float into the earth's environs from outside space.

MEASLES PREVENTIVE AND CURE NOW ASSURED

Measles will become one of the preventable diseases in the very near future. The latest of medical achievements bids fair to bring this epidemic disease of childhood under partial control at least.

The discovery of a streptococcus that causes measles by Dr. N. S. Ferry and L. W. Fisher of Detroit has been announced by the American Medical Association. This organism produces a soluble toxin that can be used in the production of antitoxin on a large scale. This antitoxin, which consists of horse serum treated with the measles toxin, can be used in both preventive and curative treatment of measles.

The triumph of medical science over diphtheria and scarlet fever, both of which diseases are now capable of being controlled, was accomplished by similar steps and methods.

The new measles discovery is in accord with similar results obtained by Drs. G. F. and Gladys H. Dick in Chicago in 1924 in studies on scarlet fever. It appears, according to medical authorities, that in some of their many forms streptococci are accountable for a variety of diseases, besides being able to induce general blood poisoning.

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Blood serum from convalescent measles patients has been in current use with some degree of success as a means of prevention with children that have already been exposed.

Now schools should not be closed when measles are prevalent, according to Dr. Victor C. Vaughan, chairman of the division of medical science of the National Research Council, whose son, Dr. Henry F. Vaughan, health commissioner of Detroit, has been concerned in the research on measles toxin. Every child, he said, should be inspected daily because a skilled physician is able in the majority of instances to detect this disease in the pre-eruptive stage. When this is done the child should be sent home andput to bed and exposed children should be treated with the convalescent serum.

Uncomplicated measles is not highly fatal but it pre-disposes to virulent pneumonia. One attack of measles gives lasting immunity while adults who have not had the disease are quite as susceptible as children. The younger the child, however, the more fatal is the disease, the death rate being highest among those under one year of age.

GREATEST ARCHAEOLOGICAL PROJECT TO UNEARTH ANCIENT ATHENS

The greatest archaeological venture of all history is about to begin. The ancient agora or civic center of Athens is to be unearthed.

Millions of dollars are to be spent, thousands of Athenians will leave their present homes for new residences, thousands of laborers are to be kept at work excavating for some fifty years, and two generations of archaeologists are to explore and study the seat of the greatest civilization of the classical world.

America with the cooperation of the Greek Government will sponsor this ambitious undertaking. Prof. R. V. D. Magoffin, president of Archaeological Institute of America, now en route to Athens, in a special statement prepared for Science Service explains, as follows, the archaeological opportunity that is now to be realized:

Rumors of the willingness of the Greek Government to allow some foreign government or agency to excavate the ancient agora, or civic center of Athens, set the archaeological world agog with excitement. The scientific importance of such an excavation was stupendous, and the hopes of finding many objects of value, as well as of interest, were almost certain of realization. Other nations which might well have expected to win such a concession, magnanimously stepped aside and let it, be understood that they favored having the offer made to the United States of America.

The acceptance of that offer by the Greek Government to the United States through the American School of Classical Studies in Athens was announced last year by Prof. Edward Capps, chairman of the managing committee of that school. At that time it was understood that the United States would pay for the houses, which would be demolished and for the work of excavation, and that the Greek Government would pay for the land which should be expropriated. A short time ago it was understood that a modification of the Greek side of the agreement would be made because of the continued financial difficulties there. This will probably be only

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a temporary incapacity on the part of Greece. The full cooperation of the Greek Government, however, will guarantee that no fancy prices will be set upon either land or buildings.

It is anticipated that such excavations will continue for not less than fifty years. The splendid opportunity is clear at once. Such excavations, conducted in the scientific manner guaranteed by the experience and obligations of the American School of Athens, will train two generations of visiting professors and resident graduate fellows and students. The amount of enthusiasm which will be brought back by the persons who have had some months or a year or two at Athens, will soon be reflected in a livelier and more appreciative attitude on the part of the students in this country.

VOICE SAVING POOR ECONOMY

"Speech should be taught as a physical exercise - as a sitting up, looking at, breathing deep exercise," is the opinion of John P. Opdycke, of New York, who surveys the language situation in America andmakes a plea for better treatment of voices and words, in a forthcoming issue of American Speech.

Mr. Opdycke finds that laziness is the cause of most of the shortcomings in children's speech; and he recommends that the physical training department in the average junior and senior high school should work actively in cooperation with the English department in making alert, clear-thinking speakers of the students.

The English teacher's fight against speech laziness is bound to be a hard one, he points out, so long as business men talk around cigars and women mumble and swallow their voices. But the fight is worth while, because a good voice is one of the greatest personal, professional, and business assets that a school can furnish to its students.

"Every teacher of English should be obliged to quality for the teaching of oral English simultaneously with his qualifying as a teacher of 'written' English" Mr. Opdycke declares.

CANCER HEREDITY DEFENDED BY DR. SLYE

A staunch defense for the inheritability of cancer was put up by Dr. Maud Slye of the University of Chicago, in a recent address. She rapped what she calls the fundamentalists in science who, while they concede the value of her long series of experiments on cancer susceptibility and resistance in mice, doubt the possibility of a similar application of the same laws to the human species.

The possibility of cancer inheritance in humans cannot be dismissed, she said, because of the haphazard matings of man. The chance mating of two hybrid carriers of any given recessive, such as cancer has proved to be in mice, is almost certain to occur sooner or later. When it does the recessive character appears in the children. Thisaccounts for its sudden appearance when there has been no known a temporary [illegible] on the part of [illegible]. The bill [illegible] of the [illegible] Government, however, [illegible] land at Washington.

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known case of cancer in the family for two or more generations.

The attempt to settle the question of inheritability of cancer by means of statistics is absurd, she maintained, because it cannot be discovered which are reall resistant and which are resistant themselves but have the power to transmit susceptibility to their children. Only by selective breeding and analysis with the right number and right kind of hybrid crosses in the laboratory can definite data be obtained to prove or disprove the hereditary tendencies of cancer.

"The great difficulty in studying human heredity," Dr. Slye said, "is that man is so long lived an animal that no one individual can collect accurate data for three generations. But this does not mean that there are no heredity facts unbrokenly expressing themselves in the human species just as they do in other animals of a shorter life span, whose exact records are being taken. If we would establish permanent recorded periodic examinations of each living individual and permanent recorded accurate necropsy findings of all dead, in three generations we would have valuable scientific data."

ANTI-EVOLUTION LAW MENACES STATE'S SCHOOLS

Tennessee's anti-evolution law after being in force for nearly a year, has had a serious effect upon the schools of the state, according to Judge John R. Neal, member of the counsel who last summer defended John T. Scopes at the celebrated Dayton trial. The appeal of the verdict against Mr. Scopes on the grounds of the alleged unconstitutionality of the law is still pending before theTennessee supreme court, and will probably be heard in May.

Judge Neal made the following statement through Science Service:

"The appalling effect of the anti-evolution law in Tennessee is written in the anxious faces of every science teacher in the high schools, and the state university. At least to these individuals it has ceased to be a joke and become a terrifying reality, for the following reasons:

"In the first place immediately after the passage of the law the text-book commission of the state, of which the governor is the head, either deleted the science text-books of all reference to evolution or selected new science books of an inferior character because they contained no reference to evolution. The teachers were informed that unless they made sole use of these inferior text-books they would be dismissed and prosecuted under the anti-evolution law.

"Second, I have been informed by numerous science teachers that almost every recitation has become a trying ordeal on account of the necessity of avoiding the questions either asked innocently or designedly by the students the proper answer to which would lead to a discussion of evolution.

"Thirdly, The public announcement of boards of education and superintendents of public instruction that no teachers of science will be employed or retained who do not satisfy them that they will not only not teach evolution but that they do not believe in evolution. As a result many timid teachers are becoming fearful of discussing scientific subjects even in private conversations.

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The attempt to settle the question of inheritability of cancer by means of statistics is absurd, even unscientific, because if cancer is inheritable [illegible] and which are [illegible] themselves but have the power to transmit susceptibility to cancer [illegible]. Only by selective breeding and analysis with the right number and right kind of inbred strains in the laboratory can [illegible] be [illegible] to prove or disprove the hereditary tendency to cancer.

"The great difficulty in studying human heredity," Dr. Slye said, "is that man has long lived [illegible] one individual the entire [illegible] three generations. But that does not mean that there are [illegible] reproduction [illegible] in the human species [illegible] because [illegible]. If we could [illegible] perfect [illegible] of all [illegible], in three generations we could [illegible]."

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ANTI-EVOLUTION LAW [illegible] TEACHERS

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Judge Neal made the following statement to Science Service:

"The appalling effect of the anti-evolution law of Tennessee is evident in the entire range of every science course in the high schools and the state university. At least to those individuals it has caused to lose their jobs [illegible], for the following reasons:

"In the first place immediately after the passage of the law the text-book commission of the state, of which the governor is the chairman, [illegible] two-thirds of all references to evolution or [illegible] because they permitted [illegible] were informed that unless they [illegible] they would be dismissed and prosecuted under the anti-evolution law.

"Secondly, I have been informed by numerous teachers [illegible] has become a [illegible] subject on account of the [illegible] questions [illegible] which would lead to a conviction of violation.

"Thirdly, the public announcement of [illegible] public instruction that no teachers of science will be employed or retained [illegible] in evolution. As a result many high schools [illegible] scientific subjects such as [illegible]."

"An ominous silence continues to brood over the university. The president of the university and the administrative authorities refuse to answer queries of newspapers as to whether the anti-evolution law has necessitated changes in textbooks and methods of teaching science. They evidently appreciate the danger involved in frankly answering this question. If they should say yes they realize they would receive the contempt and ridicule of the scientific world; if they say no, they subject themselves to criminal prosecution. Discontent and dissatisfaction among the student body however is becoming more apparent every day. The intelligent and ambitious student who desires later to pursue professional courses in the larger Eastern and Northern universities is becoming apprehensive that his credits in science will not be accepted by these institutions.

"There is absolutely no possibility of the repeal of the anti-evolution law by the next legislature unless public opinion is enormously changed. The present governor, who approved the bill and who is a candidate for reelection, has announced as part of his platform that he will veto any effort to repeal the law. His only antagonist claims to be the real author of the bill.

"The press of the state as a whole have given no assistance whatever to those who have led the fight against the bill.

"The sole hope of any immediate relief lies in the possibility of securing in the Scopes case a decision of the Supreme Court of Tennessee to the effect that the act is unconstitutional."

* * *

EVOLUTION SUPPORTED BY ANTHROPOLOGICAL SOCIETY

American anthropologists have gone on record as to their attitude with regard to the evolution of man. A resolution which states in effect that man is part of the animal world and is subject to the great natural principle of evolution has just been adopted by the Council of the American Anthropological Association, the central association of the anthropologists, archeologists and ethnologists in this country.

The resolution was framed in order to express simply but firmly the sentiment of the Association on this important subject, according to Dr. Ales Hrdlicka, president of the organization.

"The association wishes to show that so far as the anthropologists are concerned, evolution, human as well as animal, is no more a question of any theories, but a natural, well demonstrated and grand - perhaps the grandest - principle and function of nature," said Dr. Hrdlicka.

The text of the resolution reads as follows:

"In view of the dogmatic objections raised against the theory of evolution the council of the American Anthropological Association have thought it advisable to formulate the present position of scientific inquiry.

"The plants and animals belonging to early periods of the earth's history show that the forms have not remained the same for any length of time. The changes that

have occurred are of such character that we are compelled to consider the later forms as descendants of older forms. No form of living being has remained the same through the ages. The evidence of past times is corroborated by the structural and developmental analogies observed in related forms, proofs of a gradual differentiation from common ancestral forms.

"The minute structure of all living matter is alike and shows that all organisms, from the lowest to the highest, must be considered as a unit.

"Man has succeeded in producing a variety of forms of domestic animals and cultivated plants which differ from their ancestors. Our success, accomplished in a very short period, indicates that in long periods nature will produce more fundamental changes.

"Man is part of the animal world. In all respects his anatomical structure conforms to that of the rest of the animal world. His prenatal life closely parallels that of the higher mammals. The same influences that control their development after birth control him and he responds in a like manner to the environment in which he is placed. Prehistoric archeology has shown that, in the course of the ages, man has undergone great changes in physical type and that ancient man differed from modern races, the more so the more ancient the remains.

"Local types of man have developed on every continent and their existence proves that changes in the heritable characteristics of racial groups are effected in the course of time.

"We must conclude that the bodily form of man as well as that of animals and plants has changed and is still changing, not in the course of centuries, but in long periods.

"The exact cause of changes in the form of organisms and the conditions under which they occur, as well as the causes making for stability, are still imperfectly known. The principle of change has been so well established that it should become the common property of mankind."

WOULD GIRDLE THE GLOBE IN DAWN-TO-DUSK FLIGHT

Around the world in seventeen hours, the length of the daylight period on a long summer day, is the dream of Dr. Charles H. T. Townsend, of Itaquaquecetuba, Brazil, writing in the Scientific Monthly. To do this at the latitude of New York would require a constant speed of 815 miles per hour, nearly three times the highest speed yet attained by airplanes over even short distances.

Even at that, however, Dr. Townsend does not think his dream outside the limits of possibility. Man began flying only a short time ago, after studying the flight of birds for many centuries, and he has already far outdone the birds in speed, in altitude and in weights carried, though he has not yet proved himself the equal of the best of them in long-distance non-stop flights. To reach the terrific speed necessary for a dawn-to-dusk flight around the world, however, a different animal model will have to be studied, in the opinion of Dr. Townsend. He has made observa-

tions on the flight of a certain genus of large flies, known to scientists as Cephenemyia, which have flying speeds of about400 yards a second, or over 800 miles an hour. This does not equal the velocity of a modern rifle bullet, but is faster than an old-fashioned musket ball and as fast as the projectiles of certain kinds of artillery. If such a velocity could be reached by a flying machine it would easily accomplish the feat dreamed of by Dr. Townsend. It is admitted that this would not be easy to accomplish by any flight mechanism known at present, but the fact remains that the flies do it. Their analogy to a long-flight aeroplane is the stronger, Dr. Townsend points out, in that the flies eat nothing whatever during their several weeks of adult life, living and flying entirely on energy stored up in the reserve food material laid up in their bodies during their prolonged feeding period as grubs. That is to say, they carry fuel and rations for all the flying that they ever do.

TABLOID BOOK REVIEW

THE TENNESSEE EVOLUTION CASE. By Robert S. Keebler. Memphis, Tenn., printed privately. 1925. When the Tennessee anti-evolution bill was passed, the Tennessee legal profession in general apparently hoped, like the pious Governor Peay, that it would be ignored, shelved and forgotten. It was a sop to the mob; it need not be enforced. But there were two men in the state who saved the honor of their cloth by rising to do battle. The story of Judge John R. Neal, who first came to the aid of young Scopes, is already well known. There is also a member of the Memphis Bar, Robert S. Keebler, who addressed his fellow-lawyers in a spirited and searching attack upon the statute. The meeting ended in an uproar, and the president of the society reproved Mr. Keebler for "discussing a religious issue." His address is now being distributed in printed form by "friends of fair play and intellectual freedom"; it is a pertinent document in the present controversy.

CORN AND CORN GROWING. By H. A. Wallace and E. N. Bressman. Des Moines; Wallace Publishing Company. 1925.

There have been hundreds of thousands of pages, possibly millions, published on the important subject of corn; to get the meat of this great mass of material extracted and boiled down into less than three hundred pages is a real feat. The authors of this book have kept their work intensely practical, so that it can fulfill a useful function as a farmer's handbook; yet they have not sacrificed the scientific side, for such subjects as the history and classification of corn, among the most difficult in all agricultural botany, are courageously attacked, and adequately treated. This is a book that should go into every library and school, indeed into every farmhouse, in the American corn belt.

Concrete barrels, which are made without hoops, are being used on the Union Pacific Railroad.

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